

EXHIBIT “16”



GOLDBERG • ZOINO & ASSOCIATES, INC.
GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

DONALD I. GOLDBERG
WILLIAM S. ZOINO
JOSEPH D. GUERTIN JR.
JOHN E. AYRES

WILLIAM R. BELOFF
NICHOLAS A. CAMPANA JR.
MATHEW A. DIPILATO
LAWRENCE FELDMAN
RICHARD F. FLANAGAN
MICHAEL A. POWERS
JAMES H. REYNOLDS
RICHARD M. SIMON
JOHN P. SULLIVAN
STEVEN J. TRETTEL

CONSULTANTS
WALTER E. JAWORSKI
STANLEY M. BEMEN

July 25, 1983
File No. G-1745-C
G-1745-W-1.9-C
G-1745-601-W-6.0

Sverdrup & Parcel and Associates, Inc.
225 Franklin Street
Boston, Massachusetts 02110

Attention: Mr. E. J. Perko

Re: Sludge Removal
Grace Site
Supercedes letter of 8/17/81

Gentlemen:

As of July 30, 1981, sludge excavation at the Grace Chemical Plant site had been completed. The remaining work to be performed included processing stockpiles of excavated sludge and backfilling excavated areas. This work was subsequently completed in August of 1981.

During the excavation and solidification work, GZA provided a full-time field technician to observe and document the operation. Numerous site visits by staff engineers were also made during this period. To summarize the results of the operation, it can be said that all of the sludge in the areas identified in the order of conditions issued by the Cambridge Conservation Commission on October 11, 1980, was removed to the extent practicable and solidified using the solidtek process. In addition, excavations were performed outside the lateral extent of the above areas to "chase out" additional sludge. In all cases, excavations were carried to a depth where natural soil was clearly identifiable, and any questionable material or mixtures of soil and sludge were removed and treated. Whenever possible, groundwater from the site was also used in the treatment process to aid in groundwater flushing.

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In addition to the areas identified in the order of conditions, it was observed that sludge from the settling lagoon had been removed. Although we were not responsible for this area, we did observe the final condition after removal, and, to the best of our knowledge, all of the sludge from the lagoon was removed and solidified.

If you have any questions concerning the above, please do not hesitate to contact us.

Very truly yours,

Matthew J. Barvenik

Matthew J. Barvenik
Senior Geotechnical Engineer

MJB:dlw

cc: Mr. Don Kidston



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SECTION 02227

DISPOSAL OF SPECIAL WASTES

PART 1 - GENERAL

DESCRIPTION

- A. General: The work of this Section consists of disposal of special wastes in accordance with the Contract Documents.
- B. Work Included: Provide all labor, materials, equipment and transportation required to complete all the work specified herein including but not limited to:
 1. Removal of solidified sludge material to an approved sanitary landfill site to be determined by the Contractor and approved by the Engineer.
 2. Compliance with 310 CMR 19.16 and other conditions implied by the Department of Environmental Quality Engineering in their letter of August 1, 1980 and other governing agencies which have jurisdiction outside the Commonwealth of Massachusetts.
 3. Compliance with the Order of Conditions issued by the Cambridge Conversation Commission on August 29, 1980; see Exhibit D of Division II.
 4. Clean up of the area from which the stockpiled solidified sludge was removed.
 5. Removal and off-site disposal of miscellaneous fill materials including peat, debris, latex wastes, and earthen berm containment cells at locations shown on the attached Drawing. The Contractor be advised that portions of the earthen berm containment area are constructed of shot rock from tunnel excavation.
- C. Related Work Specified Elsewhere: For normal Earthwork, see Section 02200.
- D. Drawings: See attached Drawing for location of temporary storage stockpile of solidified sludge material and location of miscellaneous fill areas.

2 SUBMITTALS

- A. The Contractor shall provide full written documentation of all activity undertaken as part of this work including:

1. Acceptance of material by approved landfill operator.
2. Plan of method of disposal within the landfill site.
3. Approval of landfill site by local Board of Health as required by 310 CMR 19.16.
4. Approval of landfill site by regional office of the Department of Environmental Quality Engineering which has jurisdiction of the site or approval of local and state agencies for landfill sites outside the Commonwealth of Massachusetts.

1.03 STANDARDS

- A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. Standard Specifications - Section 120

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

Not Applicable

1.05 JOB CONDITIONS

- A. Keep public ways clear of all spillage from trucks hauling materials from the project site. The Contractor shall clean up all spillage at no cost to the Authority.
- B. All vehicles used to transport material shall have covers to control dust.

PART 2 - PRODUCTS

APPLICABLE

PART 3 - EXECUTION

1.07 GENERAL

- A. Provide all dust control measures as specified in the Contract Documents.
- B. The site is the location of approximately 12,000 cubic yards of solidified sludge material which must be removed from the area. The solidified sludge has been stored on site in stockpiles and

in the earthen berm containment area as shown on the attached Drawing. This clay-like material is the residue from a treatment process which has rendered the material inert. The Massachusetts Department of Environmental Quality has designated this solidified sludge as a "special waste" which imposes conditions on the handling and disposal of this material as spelled out in 310 Code of Massachusetts Regulations 19.16. Because of the location of the disposal work in a flood plain, this activity is subject to conditions imposed by the Cambridge Conservation Commission under the Wetlands Protection Act.

For the bidder's information, the solidification process which created the solidified sludge material is described below. The solidification process is done by others and is not part of the work to be done under this Contract.

1. The site previously contained approximately 9,000 cubic yards of sludge which has a waste product of W. R. Grace & Company's chemical manufacturing process. In a soil and groundwater sampling program, planned in cooperation with state and federal regulatory agencies, the sludge was found to contain large quantities of organic compounds and the groundwater beneath the sludge was found to contain high concentrations of sulfate and to be acidic in nature.
2. In order to relieve the site of this unsuitable condition, the Massachusetts Bay Transportation Authority and W. R. Grace & Company, in a cooperative effort, undertook a program to solidify and stabilize this material. The solidification process involved mixing groundwater and chemicals with the sludge to produce an insoluble solid that is chemically and mechanically stable and will not revert to its original form. The end result of the process is the clay-like inert material which is presently on the site.
3. The solidification process involved four steps. First, the sludge was loaded into a Charging Area, a sixty foot by sixty foot containment area for the sludge prior to processing. Second, the sludge was loaded into a hopper and conveyed to a Mixing Area where the chemicals and contaminated groundwater were blended in with the sludge to achieve solidification. Third, the treated sludge, still in liquid form, was transported to the Deposit Area, a series of containment cells formed by earth berms. The sludge remained in the Deposit Area for approximately 10 days to achieve a clay-like consistency in which it can be easily handled. Fourth, the now dry, solidified sludge was transported to a temporary storage stockpile preparatory to being removed from the site under the present Contract.

To ensure complete removal of the sludge from the containment area, the exposed surface of the earthen berm shall be removed and disposed

of as special waste. The depth of berm to be removed shall be determined in the field by the Engineer.

The site is also the location of approximately 5,000 cubic yards of miscellaneous fill material as indicated on the Drawing which must be removed from the area.

PART 4 - COMPENSATION

MEASUREMENT

A. Measurement will be made in accordance with the following method:

1. Removal of Solidified Sludge Material: All material to be removed will be measured in its original, stockpiled position by the cross section method except that where such measurement is impracticable the volume shall be measured by such other methods as the Engineer may determine. Payment will be made only for removal of material to the original ground surface or as directed by the Engineer.
2. Removal and disposal of the miscellaneous fill material shall be measured and paid for as specified in Section 02200 of these specifications for earth excavation.

PAYMENT

... Basis of Payment:

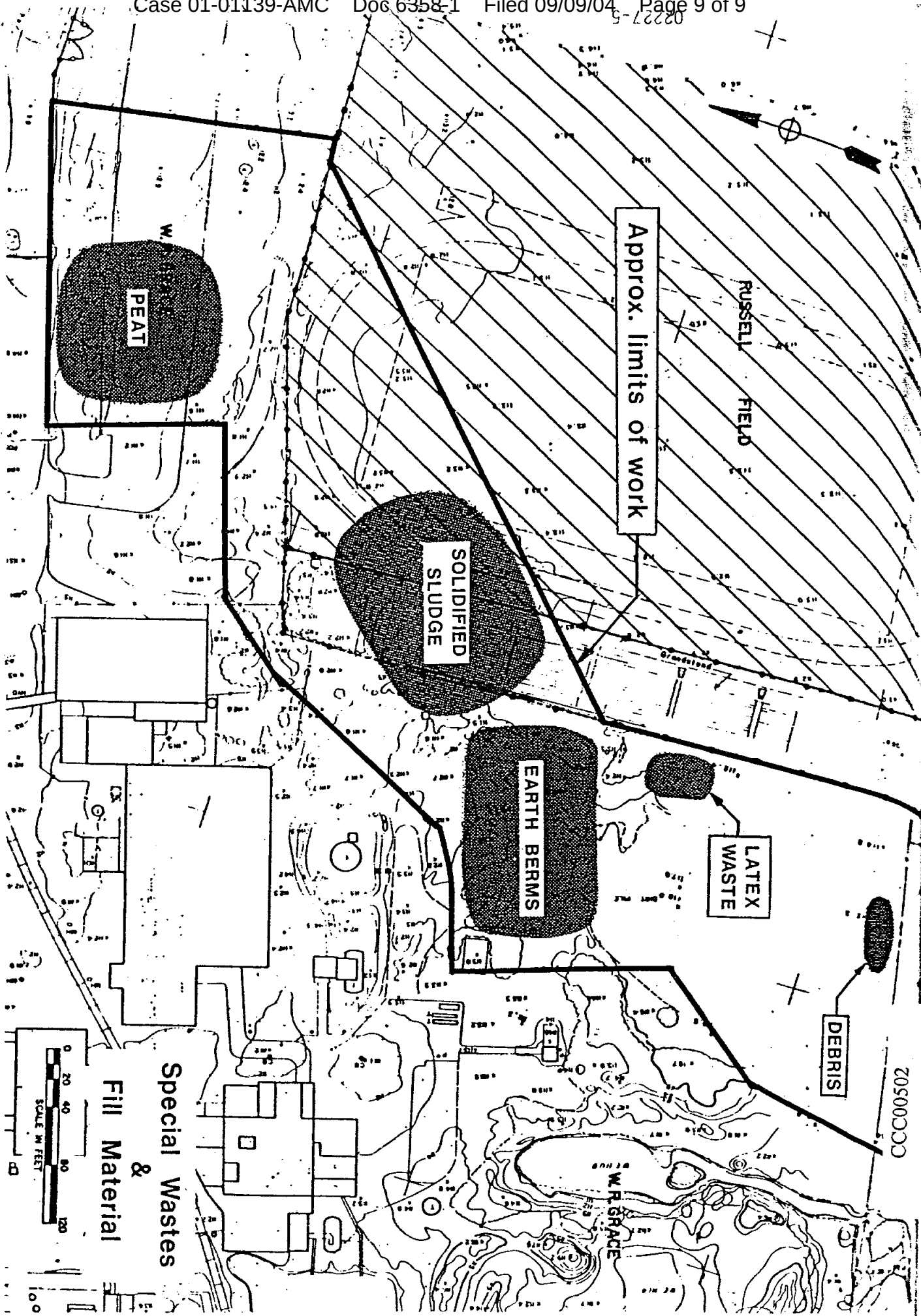
1. The work of this Section will be paid for at the Unit Prices listed in the Proposal. The prices and payments shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals required to complete the work.
 - a. All costs for clean up of the stockpiled solidified sludge area and the immediate surrounding area will be included in the unit price for removal. This may require sweeping and other hand work.
 - b. All administrative costs involved in disposing of the solidified sludge, including but not limited to those described in the Contract Documents, will be included in the unit price for removal.

PAY ITEM LIST

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|---------------|------------------------------|----|
| ITEM 0211.750 | REMOVAL OF SOLIDIFIED SLUDGE | CY |
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Special Wastes
&
Fill Material

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